

Applicant(s): Eitan Bachmat, Tao Kai Lam and Ruben Michel  
Serial No.: 09/541,159  
Filed: March 31, 2000

E30-043 (99-202)

2002, please amend the above-identified patent application as follows:

In the Specification

Please cancel the paragraph at page 1, lines 2 through 7 and replace said paragraph with the following paragraph:

12  
--This is a continuation-in-part of copending application for United States Letters Patent No. 6,088,766 granted July 11, 2000 (Serial No. 09/002,428 filed January 2, 1998) that is a continuation-in-part of copending application for United States Letters Patent No. 6,061,761 granted May 2, 2000 (Serial No. 08/944,606 filed October 6, 1997) and that is assigned to the same assignee as this invention. --

Please cancel the paragraph at page 6, lines 1 through 16 and replace said paragraph with the following paragraph:

15  
-- Recently more rigorous analyses have been implemented to provide dynamic reallocation based upon actual usage. United States Patent No. 6,189,071 granted February 13, 2001 (Application Serial No. 09/143,683 filed, August 28, 1998) discloses one such analysis that includes the step of providing an approximation of disk seek times. Generally these

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ad approaches determine seek distances and convert the seek distances into time. In more specific terms, this approach uses a statistical analysis by which actual disk accesses are weighted and combined to produce an estimated seek activity. Then this estimate is converted to a seek time by combination with a value,  $t_{i,j}$ , that is an approximation of the seek time between two logical volumes  $i$  and  $j$ . However, in some applications it may be desirable to obtain more accurate seek times to use in selecting exchangeable logical volumes that, in turn, can optimize the performance of a disk array storage device. --

Please cancel the paragraph at page 22, line 13 through page 23, line 3 and replace said paragraph with the following paragraph:

3  
a3 -- Step 226 utilizes the resulting number of seeks obtained from Equation (2) and the characteristic seek time from equation (9) to generate the total time for seek operations with the logical volume pair. That is, for a specified logical volume pair  $i,j$ , the seek time,  $seek\ time(i,j)$  is:

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$$\text{Seek time } (i, j) \frac{A_i A_j}{A} = t_{i,j} \quad (11)$$

a3  
Thus steps 220 and 226 provide a total seek time over the analysis interval for a logical volume pair  $(i, j)$ .

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Please cancel the paragraph at page 24, line 21 through page 25, line 2 and replace said paragraph with the following paragraph:

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a4  
-- FIG. 7 depicts a procedure 230 for estimating the seek time for intravolume seek operations in a selected logical volume  $i$ . For purposes of explanation and understanding, assume that the LV(2) logical volume shown in FIG. 3 has been selected. --

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Please cancel the paragraph at page 26, line 24 through page 27, line 8 and replace said paragraph with the following paragraph:

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a5  
-- As will become evident, it is only necessary to analyze the intervolume seek times for each logical volume pair. Any number of procedures can be used to avoid duplication. In one approach depicted in FIG. 8, the logical volumes on a physical disk drive are ordered by their position on the drive. For